CITY OF HAYWARD

AGENDA REPORT

AGENDA DATE 12/06/05

AGENDA ITEM _____

WORK SESSION ITEM WS 2

TO: Mayor and City Council

FROM: Director of Community and Economic Development

SUBJECT: Green Building

RECOMMENDATION:

It is recommended that City Council review and comment on this report.

BACKGROUND:

In recent years, green building design construction and operational techniques have become increasingly widespread in California and the nation, with many homeowners, businesses and building professionals voluntarily seeking to incorporate green building techniques into their projects. Some surrounding jurisdictions have instituted Green Building Ordinances, particular with regard to their own municipal projects. In the Bay Area, Pleasanton, San Jose, Dublin, Livermore, San Francisco and the County of Alameda have all adopted such ordinances. Many municipalities have also begun adopting Green Building practices and/or ordinances for economic, environmental and social equity reasons.

Defining Green Building

Green building is a whole-systems approach to the design, construction and operation of buildings that promotes resource conservation, considers environmental impacts and waste minimization, creates a healthy and comfortable indoor environment, and reduces operation and maintenance costs.

Community Benefits of Green Building

There are obvious benefits to the community of building green, especially with respect to resource conservation and environmental sustainability. Also, there are some quantifiable benefits of green building, as noted below:

- Cost Savings

  "The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force", dated October 2003 and based on Leadership in Energy Efficient Design (LEED) buildings in the State of California, states that an upfront investment of 2 percent of total construction costs in green building

design, on average, results in life cycle savings of 20 percent of the total construction costs.

- Increased Productivity

  A study by Carnegie Mellon University measuring the relationship between increased lighting control and productivity showed an average increase of 7.1 percent in productivity. Improving lighting is a component of the indoor environmental quality category of green building.

- Improved Health

  People in the U.S. spend about 90 percent of their time indoors. U.S. Environmental Protection Agency studies indicate indoor levels of pollution may be two to five times higher than outdoor levels. An investigation of 20 studies with 30,000 subjects found significant associations between low ventilation levels and higher carbon dioxide concentrations, a common symptom in facilities with sick building syndrome. Improving ventilation and reducing toxic building materials are both components of green building.

- Reduce Environmental Impacts

  Buildings represent 39 percent of U.S. primary energy use (including fuel input for production), 70 percent of U.S. electricity consumption, 12 percent of all potable water, and 40 percent of raw materials globally. In addition, the EPA estimates that 136 million tons of building-related construction and demolition debris was generated in the U.S. in a single year, compared to 209.7 million tons of municipal solid waste generated in the same year. Green building focuses on conserving energy, natural resources, and waste.

To determine if a building is "green", there are rating systems which reveal the comprehensive nature of green building.

Rating Systems

The most widely accepted and used system is the LEED rating system developed by the U.S. Green Building Council. It was created to:

- Define "green building" by establishing a common standard of measurement
- Promote integrated, whole-building design practices
- Recognize environmental leadership in the building industry
- Stimulate green competition
- Raise consumer awareness of green building benefits
- Transform the building market

The LEED green building rating system for new construction has been in use since 2000. The LEED system is used nationwide to assess green buildings. The rating system has four levels of certification, which are, from lowest to highest rating: LEED Certified, Silver Level, Gold Level,

and Platinum Level. The specific level of certification depends on the number of points a project achieves on the LEED rating system.

A project earns points through the incorporation of green building features. Points can be achieved in six general categories, as follows:

1. Sustainable Sites. Examples of methods of gaining points in this category include: selecting an urban or brownfield redevelopment site, reducing site disturbance, providing alternative transportation opportunities, treating and/or reducing the quantity of stormwater run-off, and reducing light pollution.

2. Water Efficiency. This category includes: providing water-efficient landscaping, using innovative wastewater technologies (e.g., waterless urinals, gray water irrigation), and general water use reduction.

3. Energy and Atmosphere. This category includes: Chlorofluorocarbons reductions in heating, ventilating, air-conditioning, and refrigerating equipment, optimizing energy performance of the building, use of renewable energy (e.g., solar, wind, geothermal), ozone protection, and measuring and verifying the building energy and water consumption performance over time.

4. Materials and Resources. This category includes: building reuse, construction waste management, resource reuse, and the use of recycled content, local/regional materials, rapidly renewable materials, and certified wood.

5. Indoor Environmental Quality. This category includes: carbon dioxide monitoring, ventilation effectiveness, low-emitting materials, indoor chemical and pollutant source control, thermal comfort, and daylight and views.

6. Innovation and Design Process. This category includes innovative green features that are not covered in the other categories. Examples include education of occupants and lifecycle analysis of material choices.

At present, there is no rating system specifically for residential projects, although one for new homes is currently under development.

The Alameda County Waste Management Authority (ACWMA) has developed rating systems for single-family residential and multiple family residential projects. The County rating systems, called the New Homes Green Points Calculator and the Multi-family Green Points Project Tool, are similar to the LEED rating system, except they have been modified to evaluate residential projects and to make the verification process simpler. Green Points is a rating system based on the various green features incorporated into the project. It is assessed in three main green building categories: Indoor Air Quality, Energy and Resource Efficiency (Attachment "A").

Sara Connor Court, the 57 unit housing project built by Eden Housing used Alameda County Waste Manage Authority's rating system. ACWMA provided consultants who specialize in

green building and bay-friendly landscaping. They also provided $50,000 in funds. Eden Housing also received a $25,000 grant from Home Depot Foundation and is awaiting $50,000 from the Enterprise Foundation's Green Communities Program. Attachment "B" is the list of green specifications incorporated into the project.

Green building is the convergence of three fundamental objectives: 1) conserve natural resources, 2) increase energy efficiency and 3) improve indoor air quality. Achieving these objectives is best realized by specifying designated green building methods and materials during the schematic design phase or early on in pre-development. Each green initiative incorporated into a building's development promotes a unique benefit for the builder, the environment and end-user.

In Alameda County, there is a wealth of information for developers, home owners, builders and municipalities to achieve the goal of incorporating green building techniques into their design concepts. Alameda County Waste Management Authority at www.stopwaste.org has published several books on green building and a certified green building professional or a materials database is on-line at www.build-green.org. There is also a Green Resource Center hotline at 888-40-GREEN.

Council may wish to consider adopting a resolution similar to Attachment C, which would encourage builders of residential multi-family and tract developments to voluntarily adopt green build practices in their projects. Staff's recommendation is any project which involves 20 units or more be evaluated on the basis of the ACWMA's Green Points checklist with a goal to achieve 50 points or more through a combination of the three main catogories, Indoor Air Quality, Energy Efficiency and Resorce Efficiency. A voluntary compliance program would provide for a gradual transition toward green building practices. Beginning March 1, 2006, residential development applications would be required to submit the Green Points checklist as part of an application for land use entitlements. The March 1 date allows for adequate notice to the development community of this new application element. The information gained from the Green Points checklist would be included in all reports on an application to the Planning Commission and City Council, so that those bodies would be aware of the green building aspects of the project. After one year, the staff could provide a report on the degree of voluntary compliance achieved. Once the developers, staff, suppliers and other parties to the development effort become more experienced with green building, the City could evaluate whether to adopt a mandatory ordinance for residential development.

With regard to Commercial projects, Alameda, Berkeley, Dublin and Livermore have all adopted ordinances requiring all City projects to meet LEED Silver Certification. Pleasanton and Oakland have ordinances requiring all commercial and industrial projects to comply, if either valued at 3 million, or over 20,000 square feet. At this time, Pleasanton is working with the assistance of the ACWMA to evaluate the success of the mandatory ordinance. Staff, therefore, recommends that Hayward allow that process to be completed prior to initiating a mandatory ordinance for commercial projects in order to maximize the opportunities for a successful local program.

As noted earlier in this report, several Bay Area jurisdictions have instituted green building ordinances covering municipal projects. If Council desires, such an ordinance could be drafted for the City of Hayward, requiring compliance to the minimum standard of LEED Silver.

It should be noted that all other jurisdictions surveyed have included specialized staffing in the form of Green Building Coordinator or Compliance Official to administer both the voluntary and mandatory green building ordinances. Staff recommends that Hayward adopt a similar staffing pattern.

Preparred by:

Hilary Herman
Building Official

Recommended by:

Sylvia Ehrenthal, Director
Community and Economic Development

Approved by:

Jesús Armas, City Manager

Attachments: A ACWMA Green Points Rating System
B Sara Conner Court Green Specifications
C Model Resolution for Residential Green Building Guidelines

Green Points

Green Points is a rating system that has been developed to offer builders, homeowners and municipalities a tool to assess how environmentally friendly or "green" a home is. The rating system is based on the various green features incorporated into the home. A home that has earned 50 points or more across the 3 main green building categories – Indoor Air Quality, Energy Efficiency and Resource Efficiency – can be considered a "green home". Total points required may be adjusted in the future. The rating system was developed in coordination with local builders, city planners and building officials. To simplify the system and to avoid double counting, each measure is assigned to *one* specific category, even though many of them can be placed in multiple categories.

POINTS PER CATEGORY	Resources	Energy	IAQ/Health
A. Site			
1. Recycle Job Site Construction & Demolition Waste 50% Recycling Rate is Required; 65% = 1 point; 75% = 2 points; 80% = 4 points	up to 4		
2. Donate Unused Materials	4		
3. Protect Native Soil	2		
4. Minimize Disruption of Existing Plants & Trees	1		
5. Implement Construction Site Stormwater Practices	2		
6. Protect Water Quality with Landscape Design	2		
7. Design Resource-Efficient Landscapes	4		
8. Reuse Materials/Use Recycled Content Materials for Landscape Areas	2		
9. Install High-Efficiency Irrigation Systems	2		
10. Provide for On-Site Water Catchment / Retention	2		
Available Points	**25**		
B. Foundation			
1. Incorporate Recycled Flyash in Concrete 15% Recycled Flyash = 2 points; Add 1 point for every 10% increase of flyash, up to 5 points	up to 5		
2. Reuse Form Boards	1		
3. Use Aluminum Forms	3		
4. Use Recycled Content Aggregate	2		
5. Insulate Foundation/Slab before backfill		3	
6. Install Rigid Foam, Insulated Concrete Forms (ICFs)		3	
Available Points	**11**	**6**	
C. Structural Frame			
1. Substitute Solid Sawn Lumber with Engineered Lumber			
a. Floors	1		
b. Headers (non-structural)	1		
c. Structural beams and headers	1		
2. Use FSC Certified Wood for framing (For every 10% of FSC lumber used = 2 points, up to 10)	up to 10		
3. Use Wood I-Joists for Floors and Ceilings	2		
4. Use Steel Interior Web Trusses	2		
5. Design Energy Heels on Trusses		2	

POINTS PER CATEGORY	Resources	Energy	IAQ/Health
C. Structural Frame (continued)			
6. Use OSB			
a. Subfloors	1		
b. Sheathing	1		
7. Use Finger-Jointed Studs for Non-Structural Vertical Applications	2		
8. Use Engineered Studs for Vertical Applications	2		
9. Use Recycled Content Steel Studs for Interior Framing	2		
10. Use Structural Insulated Panels (SIPs)			
a. Floors		3	
b. Wall		3	
c. Roof		3	
11. Apply Advanced Framing Techniques	4		
12. Use Reclaimed Lumber for Non-Structural Applications	3		
Available Points	**32**	**11**	
D. Exterior Finish			
1. Use Sustainable Decking Materials			
a. Recycled content	3		
b. FSC Certified Wood	3		
2. Use Non-CCA Treated Wood			1
3. Install House Wrap under Siding			1
4 Use Alternative Siding Materials			
a. Recycled content	1		
b. Fiber-cement	3		
Available Points	**10**		**2**
E. Plumbing			
1 Insulate all Hot Water Pipes		2	
2 Install Flow Reducers			
a. Faucets (1 point each, up to 2 points)	up to 2		
b. Showerheads (1 point each, up to 2 points)	up to 2		
3. Install Ultra-Low Flush Toilets (1 point each, up to 4 points)	up to 4		
4. Install Chlorine Filter on Showerhead			4
5. Install Tankless Water Heater		2	
6. Pre-plumb for Graywater Conversion (check with local code)	4		
7. Install Water Filtration Units at Faucets (2 points each, up to 4 points)			up to 4
8. Install On-Demand Hot Water Circulation Pump	4		
Available Points	**16**	**4**	**8**
F. Electrical			
1. Install Compact Fluorescent Light Bulbs – CFLs. (6 bulbs=2 points, 12=4 points, up to 4 points)		up to 4	
2. Install Air-Tight Insulation-Compatible Recessed Fixtures for CFLs (1 point each, up to 5 points)		up to 5	
3. Install Lighting Controls (1 point per fixture, up to 4 points)		up to 4	
4. Install High Efficiency Ceiling Fans with CFLs (1 point each, up to 4 points)		up to 4	
Available Points		**17**	
G. Appliances			
1. Offer Energy Star Dishwasher		1	
2. Offer Horizontal Axis Washing Machine		1	
3. Offer Energy-Efficient Refrigerator		1	
4. Install Built-In Recycling Center	3		
Available Points	**3**	**3**	

POINTS PER CATEGORY	Resources	Energy	IAQ/Health
H. Insulation			
1. Upgrade Insulation to Exceed Title 24 Requirements			
a. Walls		2	
b. Ceilings		2	
2. Install Recycled-Content, Formaldehyde-Free Fiberglass Insulation			3
3. Use Advanced Infiltration Reduction Practices		2	
4. Use Cellulose Insulation			
a. Walls	4		
b. Ceilings	4		
Available Point	**8**	**6**	**3**
I. Windows			
1. Install Energy-Efficient Windows			
a. Double-Paned		1	
b. Low-Emissivity (Low-E)		2	
c. Low. Conductivity Frames		2	
Available Points		**5**	
J. Heating Ventilation and Air Conditioning			
1. Use Duct Mastic on All Duct Joints		1	
2. Install Ductwork Within Conditioned Space		3	
3. Vent Range Hood to the Outside			1
4. Clean all Ducts Before Occupancy			2
5. Install Attic Ventilation Systems		1	
6. Install Whole House Fan		4	
7. Install Sealed Combustion Units			
a. Furnaces			3
b. Water Heaters			3
8. Install 13 SEER/11EER or higher AC with a TXV		3	
9. Install AC with Non-HCFC Refrigerants	2		
10. Install 90% Annual Fuel Utilization Efficiency (AFUE) Furnace		2	
11. Eliminate Wood Burning Fireplaces			1
12. Install Zoned, Hydronic Radiant Heating		3	
13. Install High Efficiency Particulate Air (HEPA) filter			4
14. Install Heat Recovery Ventilation Unit (HRV)		5	
15. Install Separate Garage Exhaust Fan			3
Available Points	**2**	**22**	**17**
K. Renewable Energy and Roofing			
1. Pre-Plumb for Solar Water Heating		4	
2. Install Solar Water Heating System		10	
3. Pre-Wire for Future Photovoltaic (PV) Installation		4	
4. Install Photovoltaic (PV) Panels (1.2 kw = 6 points, 2.4 kw = 12 points, 3.6 kw = 18 points)		up to 18	
5. Install Solar (PV) Walkway Lights		4	
6. Select Safe and Durable Roofing Materials	1		
7. Install Radiant Barrier Roof Sheathing		3	
Available Points	**1**	**43**	

POINTS PER CATEGORY	Resources	Energy	IAQ/Health
L. Natural Heating and Cooling			
1. Incorporate Passive Solar Heating		5	
2. Install Overhangs or Awnings on South Facing Windows		3	
3. Plant Deciduous Trees on the West and South Sides		3	
Available Points		**11**	
M. Indoor Air Quality and Finishes			
1. Install Whole House Vacuum System			3
2. Use Low/No-VOC Paint			1
3. Use Low VOC, Water-Based Wood Finishes			2
4. Use Solvent-Free Adhesives			3
5. Substitute Particleboard with Formaldehyde-Free Materials			6
6. Use Exterior Grade Plywood for Interior Uses			1
7. Use Formaldehyde-Free MDF and Materials			4
8. Seal all Exposed Particleboard or MDF			4
9. Use FSC Certified Materials for Interior Finish			4
10. Use Finger-Jointed or Recycled Content Trim	1		
Available Points	**1**		**28**
N. Flooring			
1. Select FSC Certified Wood Flooring	8		
2. Use Rapidly Renewable Flooring Materials	4		
3. Use Recycled Content Ceramic Tiles	4		
4. Install Natural Linoleum in Place of Vinyl			5
5. Use Exposed Concrete as Finished Floor	4		
6. Install Recycled Content Carpet with Low VOCs	4		
Available Points	**24**		**5**
Other			
1 Incorporate Listing of Green Features into Cover of Blueprints	1		
2 Develop Homeowner Manual of Green Features/Benefits	1		
3 Offer Coupons for Compost Bins to Homeowners (contact ACWMA, 1-877-STOPWASTE)	1		
4. Energy Ratings Every % improvement in reducing energy beyond Title 24 Code - 1 point (up to 30 points). Use energy software such as EnergyPro or MicroPas, to show improvement over California Residential Energy Standards (Title 24)		up to 30	
5. Innovation Points These points are given for innovative approaches, including model zero net energy homes, new materials and methodologies, currently not identified above. These approaches must meet environmental goals identified in the Residential Green Building Guidelines. Innovation Points will be evaluated and awarded by the community/municipality where the project is located.			

MINIMUM OF 50 TOTAL POINTS	Resources	Energy	IAQ/Health	Total
Total Available Points	**136**	**158**	**63**	**357**
Points Required from Each Category	10	10	10	30
Additional Points Needed from Any Category				20
Minimum Points Required				**50**

Project must acquire a minimum of 50 points. 10 points must be acquired, for each category. Additional 20 points can be acquired by incorporating any green features listed to reach a total of 50 points. Projects obtaining 60 points or more will receive a "Gold Level Status". Total points may be adjusted in the future or modified by individual cities.

Sara Conner Court – Green Case Study

The following "green" specifications were made in the design/development phase of Sarah Connor Court:

INCREASED WATER AND ENERGY CONSERVATION

- Kitchen & bathroom faucets and showerheads with flow-restrictors
- Toilets on East Bay Municipal Utility District Preferred Toilet List
- Landscaping plan incorporates drought tolerate native plants
- Irrigation system provides minimum amount of water required for good plant health
- Tree growth designated to areas that will reduce solar gain and moderate building temperatures
- Walkways and surface parking lot are shaded with trees to increase comfort in open spaces

INCREASED ENERGY EFFICENCY

- Energy Star refrigerators and dishwashers for all unit and community room kitchen
- Energy Star clothes washers in central laundry rooms and dryers will be gas fueled
- Hydronic heating system in all units
- Individually metered units for both gas and electricity
- Fluorescent and high-pressure sodium light fixtures for outdoor lighting
- Efficient duct design, advanced duct sealing with third party verification testing by a C-HERS rater.

INDOOR AIR QUALITY IMPROVEMENTS

- Drainage plane under siding to shed moisture & avoid mold
- Elimination of sand layer from the slab on grade design to avoid future mold issues
- Placement of exhaust fan in every bathroom that is controlled by timers connected to bathroom light
- Entryways are carpet-free to prevent the tracking-in of contaminants and help transition between indoor and outdoor space
- At least 80% of hood ranges are vented to the exterior
- Usage of low-VOC paint
- Installation of Green Label carpet, natural linoleum and formaldehyde-free, low-VOC fiberboard for cabinets

MODEL RESOLUTION FOR MEMBER AGENCIES TO ADOPT THE ALAMEDA COUNTY RESIDENTIAL GREEN BUILDING GUIDELINES AS A CITY REFERENCE DOCUMENT

CITY OF _____

RESOLUTION NO. ___

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF _____ ADOPTING THE ALAMEDA COUNTY RESIDENTIAL GREEN BUILDING GUIDELINES (FOR NEW HOME CONSTRUCTION, HOME REMODELING AND MULTIFAMILY) AS A CITY REFERENCE DOCUMENT

WHEREAS, the City of _____ 's (City) General Plan sets forth goals for preserving and improving the City's natural and built environment, protecting the health of its residents and visitors, and fostering its economy; and

WHEREAS, green building is a whole systems approach to the design, construction, and operation of buildings, which employs materials and methods that promote natural resource conservation, energy and water efficiency, and good indoor air quality; and

WHEREAS, green buildings benefit building industry professionals, residents and communities by improving construction quality, increasing building durability, reducing utility, maintenance, water and energy costs, creating healthier homes, and enhancing comfort and livability; and

WHEREAS, in recent years, green building design, construction, and operational techniques have become increasingly widespread in California and the nation, with many homeowners, businesses, and building professionals voluntarily seeking to incorporate green building techniques into their projects; and

WHEREAS, the Alameda County Waste Management Authority had developed a series of voluntary guidelines designed specifically for the residential building industry for New Home Construction, Home Remodeling and Multifamily ("Residential Green Building Guidelines") that provide helpful and valuable guidance for applying these techniques to residential building projects; and

WHEREAS, the practices contained in these Residential Green Building Guidelines were selected for their viability in today's market and their ability to promote sustainable buildings and communities; and

WHEREAS, a number of cities and counties throughout California have used these guidelines and;

WHEREAS, the adoption of the Guidelines as a reference document would not constitute a "project" within the meaning of the California Environmental Quality Act ("CEQA");

NOW THEREFORE, BE IT RESOLVED, that private residential developers should be encouraged to use green building design, construction and operation whenever feasible; and

NOW THEREFORE, BE IT FURTHER RESOLVED, that the City Council of the City of _____ adopts the Alameda County Waste Management Authority's Residential Green Building Guidelines, as they may be amended from time to time, as a City reference document and directs City staff to explore incentives to encourage use of the Guidelines by private developers of residential construction projects within the City.

ADOPTED BY THE FOLLOWING VOTE:

AYES:

NOES:

ABSENT: